



Department of
**Environment &
Conservation**

Rulemaking Listening Session SOPs Rule Chapter 0400-40-06-.10

September 18, 2019

George Garden, PE BCEE, Chief Engineer DWR

Agenda

- References
 - TCA Section 69 → impetus for Land Application and Reuse
 - EPA 2006 Process Design Manual → WW DC Chapter 16 & 17
 - EPA 2012 Guidelines for Water Reuse → Categories & Standards
- TDEC development of Rules ← Virginia Regulations
- Clarification of issues identified by comments
- Questions and additional comments
- Recommendations

Existing Legal Mandate

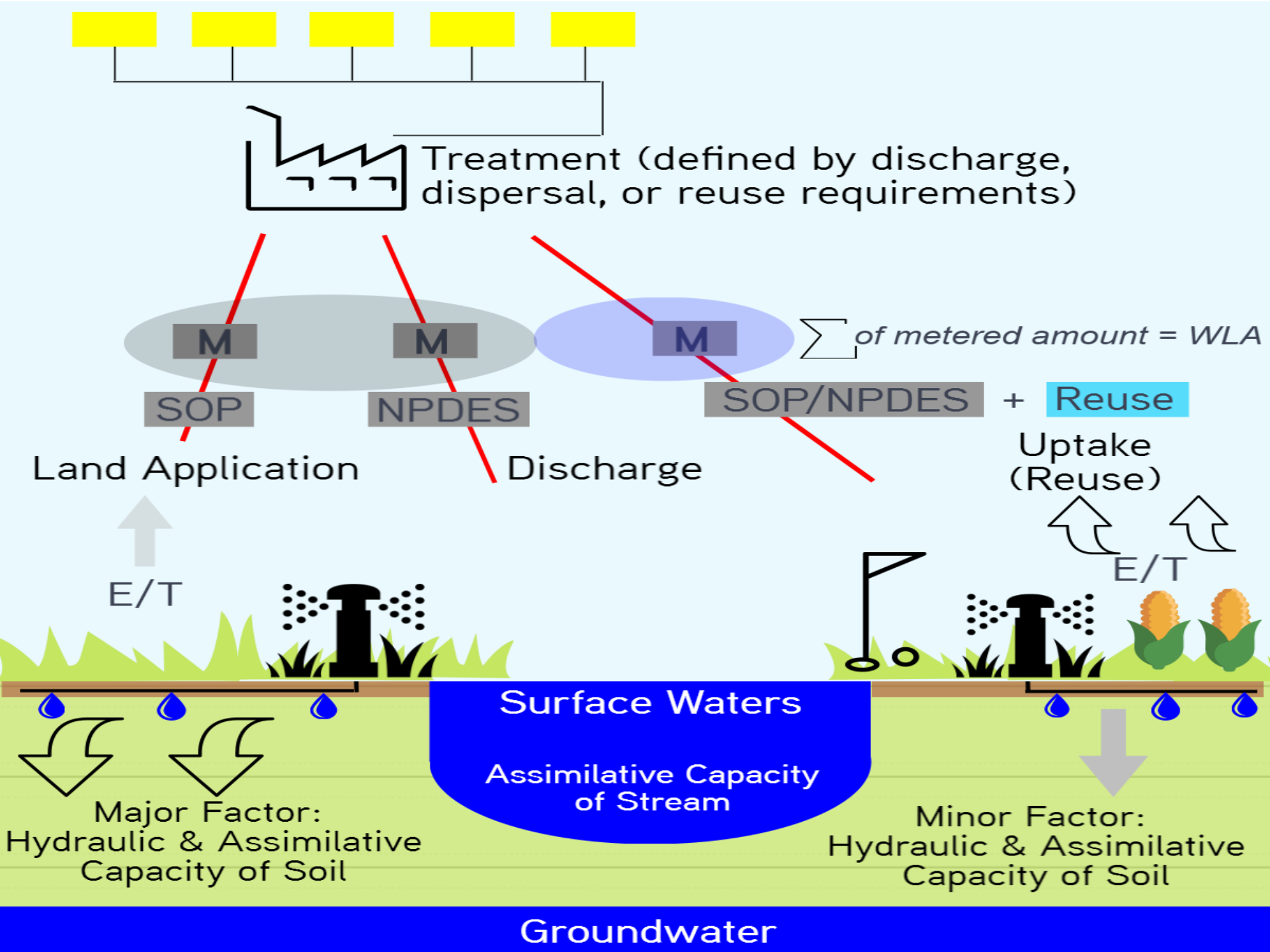
- TCA Section 69-3-108 → TDEC authority to issue NPDES and SOP permits
- TCA Section 69-3-105 → Board of Water Quality, Oil & Gas:

“The Board has and shall exercise the power to adopt rules creating a system of **incentives for alternatives** to discharges to surface waters, such as **land application** and **beneficial reuse** of the wastewater”

- TCA Section 68-221-1003 → facilities engaged in wastewater reclamation and reuse qualify for SRF funding.

“‘Wastewater facility’ means any facility, including the reserve capacity thereof, whose purpose is to collect, store, treat, neutralize, stabilize, **recycle, reclaim** or dispose of wastewater, including treatment or disposal plants, interceptors, outfall, and outlet sewers, pumping stations, equipment and furnishings thereof and their appurtenances which are necessary to accomplish the foregoing purposes.”





EPA 2012 Water Reuse Categories

CATEGORY OF REUSE		DESCRIPTION	TN?
Urban Reuse	Unrestricted	Non-potable applications; public access not restricted; e.g., public irrigation	YES
	Restricted	Public access restricted; e.g., flushing water	not yet (currently allowed by Code) → Living Buildings
Agricultural Reuse	Food crops	Crops intended for humans	not yet
	Processed food crops & non-food crops	Processed before being fed to humans or not for humans	not yet YET
Industrial		Consumed in industrial process	not yet
Potable ReUse	Indirect Potable Reuse (IPR)	WWTP → buffer → WTP	(de facto) Drought request
	Direct Potable Reuse (DPR)	(DPR)	not yet (3+ systems → long term planning)

What about the current EPA guidance?

EPA/625/R-06/016

September 2006

Process Design Manual

Land Treatment of Municipal

Wastewater Effluents....Chapter 8 continued...

...Type 2 – optimum irrigation potential, i.e. apply the least amount of water that will sustain the crop or vegetation; an irrigation or “water reuse” system with treatment capacity being of secondary importance”



Objective differences

Contrasting SR Type-1 and Type-2 systems:

“Many of the system **components** (vegetation, pre-application treatment, transmission, distribution, etc.) may be **identical for both** types. A Type-1 SR “treatment system” may be **limited by soil permeability or by nitrogen loading**. The Type-1 system utilizes deep percolation of treated wastewater for **additional capacity beyond evaporation**. To optimize reuse, the capacity of a Type-2 SR is **limited by crop water or nutrient requirements**.”

Opportunity

SR Type-1

Land Application

Soil available

Limits:

- **Soil Permeability
→ Hydraulic
Capacity**
- **Treatment - N**

SR Type 2

Beneficial Reuse

Soil available?

Limits:

- **Min. Leaching Rate**
- **Agronomic Uptake
Rate**

Opportunity

SR Type-1

Land Application

Soil available

Limits:

- Soil Permeability
→ Hydraulic Capacity
- Treatment - N



SR Type 2

Beneficial Reuse

Soil available?

Limits:

- Min. Leaching Rate
- Agronomic Uptake Rate

Water Reuse Categories: EPA 2012

Category of Reuse		Description
Urban Reuse	Unrestricted Access	The use of reclaimed wastewater for nonpotable applications in municipal settings where public access is not restricted.
	Restricted Access	The use of reclaimed wastewater for nonpotable applications in municipal settings where public access is controlled or restricted by physical or institutional barriers, such as fencing, advisory signage, or temporal access restriction.
Agricultural Reuse	Food Crops	The use of reclaimed wastewater to irrigate food crops that are intended for human consumption
	Processed Food Crops and Non-Food Crops	The use of reclaimed wastewater to irrigate crops that are either processed before human consumption or not consumed by humans.
Impoundments	Unrestricted Access	The use of reclaimed wastewater in an impoundment in which no limitations are imposed on body-contact water recreation activities.
	Restricted Access	The use of reclaimed wastewater in an impoundment where body contact is restricted.
Environmental Reuse		The use of reclaimed wastewater to create, enhance, sustain, or augment water bodies including wetlands, aquatic habitats, or stream flow.
Industrial Reuse		The use of reclaimed wastewater in industrial applications and facilities, power production, and extraction of fossil fuels.
Groundwater Recharge – Nonpotable Reuse		The use of reclaimed wastewater to recharge aquifers that are not used as a potable water source.
Potable Reuse	Indirect Potable Reuse (IPR)	Augmentation of a drinking water source (surface or groundwater) with reclaimed wastewater followed by an environmental buffer that precedes normal drinking water treatment.
	Direct Potable Reuse (DPR)	The introduction of reclaimed wastewater (with or without retention in an engineered storage buffer) directly into a water treatment plant, either collocated or remote from the advanced wastewater treatment system.

Treatment Levels & Monitoring Requirements

Based on EPA 2012 Guidelines with Tennessee Adaptations

Treatment Level 1		Treatment Level 2		Treatment Level 3	
Quality	Monitoring	Quality	Monitoring	Quality	Monitoring
pH = 6.0-9.0	Weekly	pH = 6.0-9.0	Weekly		
≤ 10 mg/l BOD (or CBOD)	Weekly	≤ 30 mg/l BOD (or CBOD)	Weekly		
≤ 2 (5) NTU (or 5 mg/L TSS)	Turbid: continuous (TSS weekly)	≤ 30 mg/l TSS	Daily (Weekly)		
No detectable fecal (e coli)/100 ml (100)	E. Coli: daily	≤ 200 cfu fecal e.coli)/100 ml	Fecal (e coli): daily		
>1 mg/l Cl ₂ residual (if e coli)	Continuous	>1 mg/l Cl ₂ residual (if e coli)	Continuous (daily)		
Reuse Categories					
<ul style="list-style-type: none"> Urban Reuse – Unrestricted Access Agricultural Reuse – Food Crops Industrial Reuse 		<ul style="list-style-type: none"> Urban Reuse – Restricted Access Agricultural Reuse – Processed Food Crops or Non-Food Crops Industrial Reuse (or case-by-case) 			

**The end use classification of impoundment will only apply if the impoundment is on the end user's property and does not have a subsequent use. Otherwise, an impoundment is acting as storage to the applicable reuse category.*

Quality and quantity limits apply at the point immediately prior to when the reclaimed wastewater leaves the control of the permittee.

Water Reuse: Overarching Considerations for Reuse Framework

- **Voluntary** participation; quality set by REUSER
- **Implemented through existing water permit programs—NPDES and SOP**
- **End users contract with reclaimed water agents.**
- **Cumulative Impact Analysis** may be required at time of application.
- R&R application requirements
 - Water reclamation **application addendum**
 - **Reclaimed Water Management Plan** describing in detail methods of reclaiming and managing wastewater and provision to end user(s)
 - **Contingency Plan** (i.e., demonstration of capacity to treat and dispose of permitted flow)
- Currently no disposal credit will be provided for reuse; in the future, TDEC **may consider reuse credit; with factors such as**
 - **Contingency plan** in the event reuse water disposition is lost.
 - **Ownership of the land or process** of disposition providing a reasonable permanence to the reuse plan? and/or
 - Observed and **recorded appropriate reuse disposition for an adequate period of time** to establish reasonably consistent use with a safety factor applied?

Non-Potable Reuse

Rule Chapter 0400-40-06-.10

- This proposed rulemaking removes State Operating Permits (SOPs) from the Rule 0400-40-05 and creates establishes a new Rule -06 for SOPs
- Covers the following types of operations and disposal of treated wastewater:
 - Land Application of Treated Wastewater Effluent
 - Animal Feeding Operations (formerly CAFOs)
 - Pump and Haul (temporary wastewater option)
 - Collection Systems (for non-NPDES permit holders)
 - **Non-Potable Reuse (formerly by EPA guidelines; applicable to NPDES permit holders as well)**

Section 0400-40-06-.10 Non-Potable Reuse

FUNDAMENTALS

- Regulates reuse of reclaimed wastewater that would ordinarily be discharged to surface streams to be used **primarily for irrigation at non-discharge and agronomic rates.**
- Does **not authorize potable reuse** of reclaimed wastewater **at this time.** (Does not address testing or development of future rules for this purpose.)
- Adopts **EPA classifications and mimics standards** of non-potable reuse
- Requires review if encroaching on **5% of 7Q10** flow
- Prohibits reuse contribution to meeting sewer availabilities.
- Reuse water standards must be “fit-for-purpose” by the reuser and informed by EPA 2012 Reuse Guidance as incorporated in Rule.

New administrative requirements

- **End user agreements** between reclaimed water providers and reusers of reclaimed water to ensure proper disposition of reuse water
- Submission and approval of **Reclaimed Wastewater Management Plan(s) (RWMPs)** for expansion or new reuse systems.
- Rule 0400-40-02 and 0400-45 applies: PWS and Wastewater **Design Criteria will have to be modified** to reflect the SOP Rules changes. Engineering plans approval in accordance with “Design Criteria” for wastewater and drinking water.
- Rule 0400-49-01 **Operator Certifications will have to be changed.**

Thank you!

Clarifications

- Potable reuse is **not authorized** by this rule. Preparations are not prohibited. Intend to have a stakeholder's group working on pilot plant and demonstration projects enroute to the potable reuse. First projects must:
 - Pass comprehensive testing
 - Demonstrate reliability by demonstration projects
 - Be justified by LCCA considering conservation measures, water loss; essentially TBL analyses.
- “Resale of reuse/reclaimed wastewater”: standard contract between provider and recipient conveying an acknowledgement of the quality and responsibilities.

Clarifications (continued)

- Environmental Reuse classification may have to be included if the “5% of 7Q10” is retained.
- The categories of reuse not addressed probably should be covered by saying that they are not authorized by this section of this rule.
- The principle of “fit-for-use” requires an arrangement between the supplier of reclaimed water and the reuser of that water.
 - TDEC intends for this to be a written acknowledgement by the reuser of the responsibility to handle the reclaimed water appropriately and for the provider to meet delivery expectations.
 - Individual contracts will not require TDEC approval after a standard contract is approved.

Clarifications (continued)

- All classification standards will likely be revised up to equivalence to EPA 2012 Standards